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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Michael D. Pashley

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS  
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EXAMINER

LOVELL, LEAH S

ART UNIT

PAPER NUMBER

2885

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/539,974

Applicant(s)

PASHLEY, MICHAEL D.

Examiner

Leah S. Lovell

Art Unit

2885

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-9,11-13,15,16 and 18-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-9,11-13,15,16 and 18-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

1. The instant application is a 371 of PCT/IB04/50945 which claims benefit of 60/482,100. The priority documents were received 19 June 2005.
2. Applicant's arguments with respect to claims 1-3, 6-9, 11, 15-16, 18-20 and 22-23 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.  
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3, 6, 8, 9, 11-13, 15, 16, 18-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakata et al. (US 7,192,147).

In regard to claim 1, Sakata discloses an optical system, comprising:

a light source [14R, 1G, 14B] that emits light in a substantially  
randomly polarized or unpolarized state [column 2, lines 14-15];

at least one reflective polarizer [8] coupled to the light source [figure  
2]; and

an optical element [15, 16, 17] having an interior that is substantially  
filled with solid material [column 5, line 25] that redirects a portion of the light

reflected by the reflective polarizer through the light source and back to the reflective polarizer [figure 2],

wherein there is substantially no optical distance between the at least one light source and the optical element [figure 2; the light source and optical element are separated by a film 3, films are inherently extremely thin; therefore, rendering the distance between the optical element and light source].

Regarding claim 2, Sakata discloses the at least one light source [14R, 14G, 14B] is disposed in the optical element [figure 2].

In regard to claim 3, Sakata discloses at least one light source [14R, 14G, 14B] being encased in the material of the optical element [figure 2 shows the light source being completely surrounded by the optical element].

In regard to claim 6, Sakata discloses the at least one reflective polarizer [8] is disposed over a surface of the optical element [figure 2].

Regarding claim 8, Sakata discloses a wavelength combiner [25] disposed adjacent to the optical element [16,17; figure 6].

In regard to claim 9, Sakata discloses an integrating rod [7] that is optically coupled to a liquid crystal display system [5].

In regard to claim 11, Sakata discloses the wavelength combiner [25] being chosen from a group consisting essentially of: a dichroic cube; a plurality of dichroic cubes; and dichroic elements [column 8, lines 11-23].

Regarding claim 12, Sakata discloses the light source being an array of light emitting diodes [figure 6 shows an array of light sources].

In regard to claim 13, Sakata discloses the light source being a single LED [figure 2].

In regard to claim 15, Sakata discloses a method of recycling light to improve efficiency of an optical system, the method comprising:

providing a reflective polarizer [8] and a source [14R, 14G, 14B] of unpolarized or randomly polarized light [column 2, lines 14-15], where the reflective polarizer [8] are coupled to the source via an optical element [16, 17] having an interior that is substantially filled with a solid material [column 5, line 25];

redirecting a portion of light reflected from the reflective polarizer through the light source and back to the reflective polarizer [figure 2], which transmits light of a particular polarization state and reflects the remaining light to the optical element [figure 2], wherein there is substantially no optical distance between the reflective polarizer and the optical element [figure 2; the light source and optical element are separated by a film 3, films are inherently extremely thin; therefore, rendering the distance between the optical element and light source].

Regarding claim 16, Sakata discloses polarizing at least a portion of the reflected light to the particular polarization state [column 6, lines 12-34].

Regarding claim 18, Sakata discloses directing the light of the particular polarization state to a liquid crystal device [column 6, lines 12-34 in combination with figure 1].

In regard to claim 19, Sakata discloses an optical package, comprising a light emitting element [14R, 14G, 14B] disposed in an optical element [15, 16, 17] having an

interior that is substantially filled with a solid material [column 5, line 25] that redirects light reflected from one end of the element back through the light emitting element and out from the one end [figure 2].

Regarding claim 20, Sakata discloses the light-emitting element emits randomly polarized light or unpolarized light [column 2, lines 14-15].

In regard to claim 21, Sakata discloses the light-emitting element [14R, 14G, 14B] is chosen from the group consisting essentially of: a single light emitting diode [figure 2] and an array of light emitting diodes [figure 6].

Regarding claim 22, Sakata discloses the light-emitting element [14R, 14G, 14B] is encased in the optical element [figure 2 shows the light source completely encased by the optical element].

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5, 24, 25, 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakata et al. (US 7,192,147) as applied to claim 1 above.

Regarding claim 5, Sakata discloses a quarter wave plate [3; column 5, lines 34-35]. Although, the quarter wave plate is not disposed between the reflective polarizer and the optical element. it would have been obvious to one of ordinary skill in the art at the time of the invention to position the quarter wave plate between the optical element and reflective

polarizer, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. One would be motivated to do so because such a rearrangement would not affect the purpose of the invention. As it stands, light is reflected off of the reflective polarizer, passes through the solid optical element, through the quarter wave plate, off of the reflector, back through the quarter wave plate where the light beam is enhanced [column 5, lines 43-44], through the optical element, and, finally, if the light beam is correctly polarized. The optical element serves as only a guide therefore having the quarter wave plate in the current position [shown in figure 2] or moving it to be between the optical element and reflective polarizer would produce the same effect on the light.

In regard to claim 24, Sakata discloses an optical system, comprising:

- a light source [14R, 15] that emits light in a substantially randomly polarized or unpolarized state [column 2, lines 14-15];
- a reflective polarizer [8] coupled to the light source [figure 2]; and
- an optical element [16, 17] that redirects a portion of light reflected by the reflective polarizer through the light source and back to the reflective polarizer [figure 2], and
- a quarter wave plate [3, column 5, lines 34-35].

However, the quarter wave plate is not disposed between the reflective polarizer and the optical element. It would have been obvious to one of ordinary skill in the art at the time of the invention to position the quarter wave plate between the optical element and reflective polarizer, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. One would be motivated to do so because such

a rearrangement would not affect the purpose of the invention. As it stands, light is reflected off of the reflective polarizer, passes through the solid optical element, through the quarter wave plate, off of the reflector, back through the quarter wave plate where the light beam is enhanced [column 5, lines 43-44], through the optical element, and, finally, if the light beam is correctly polarized. The optical element serves as only a guide therefore having the quarter wave plate in the current position [shown in figure 2] or moving it to be between the optical element and reflective polarizer would produce the same effect on the light.

Regarding claim 25, Sakata discloses the optical element [16, 17] including an interior that is substantially filled with a solid material [column 5, line 25], and the reflective polarizer [8] is disposed over a surface of the element [figure 2].

Regarding claim 27, Sakata discloses a wavelength combiner [25] disposed adjacent to the optical element [figure 6].

In regard to claim 28, Sakata discloses an integrating rod [17] that is optically coupled to a liquid crystal display system [5].

Regarding claim 29, Sakata discloses the wavelength combiner [25] being chosen from a group consisting essentially of: a dichroic cube; a plurality of dichroic cubes; and dichroic elements [column 8, lines 11-23].

In regard to claim 30, Sakata discloses the light source [14R, 14G, 14B] is an array of light emitting diodes [figure 6 shows an array of light sources].

In regard to claim 31, Sakata discloses the light source [14R, 14G, 14B] is a single LED [figure 2].

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7. Claims 7, 23, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakata et al. (US 7,192,147) as applied to claims 1, 19 and 24 above, and further in view of Holder et al. (US 7,172,319).

In regard to claims 7, 23 and 26, Sakata discloses the optical element [16] as a tapered rod lens [column 6, line 5]. However, Sakata does not disclose the optical element as a compound parabolic concentrator. Holder discloses a light source encased in a solid, compound parabolic concentrator [30]. It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the tapered rod of Sakata with the compound parabolic shape of Holder. One would be motivated to do so because it is well known in the art that parabolic shapes are extremely effective in efficiently reflecting light to a desired location and would result in an effective reflection towards the reflective polarizer/liquid crystal display.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Hayashi et al. (US 2002/0101729)
- Chuang (US 6,508,571)
- Yokoyama (US 6,547,400)
- Li (US 6,587,269)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leah S. Lovell whose telephone number is (571) 272-2719.

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The examiner can normally be reached on Monday through Friday 7:45 a.m. until 4:15 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong-Suk (James) Lee can be reached on (571) 272-7044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Leah Lovell  
Examiner  
3 July 2007

  
JONG-SUK (JAMES) LEE  
SUPERVISORY PATENT EXAMINER